

## **Historic, Archive Document**

**Do not assume content reflects current scientific knowledge, policies, or practices.**



A • R • S  
SCIENCE  
HALL  
• O F •  
FAME

December 10, 1996

United States Department of Agriculture  
Agricultural Research Service

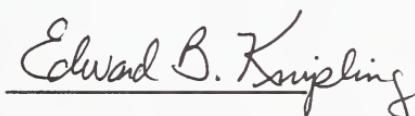


## Agricultural Research Service Science Hall of Fame

The ARS Science Hall of Fame was inaugurated in 1986. We determined that each succeeding year, one or more present or former scientists with the Agricultural Research Service could be selected, subject to the following criteria:

- The selectee made a major impact on agricultural research, either by the solution of a significant agricultural problem through research or by providing outstanding leadership that significantly advanced agricultural research.
- The selectee is a person whose accomplishments are still recognized by the agricultural research community.
- The selectee's character and record of achievement are worthy of emulation by younger agricultural scientists.
- The selectee's achievements must be or have been nationally and/or internationally recognized by peers in the scientific community.

Today we honor several outstanding scientists by inducting them into the Science Hall of Fame. A plaque citing the achievements of each will be on permanent display in the ARS National Visitor Center at the Beltsville Agricultural Research Center.



Edward B. Knipling

Edward B. Knipling  
Acting Administrator  
December 10, 1996



# 1996

---

Fred W. Blaisdell  
Research Hydraulic Engineer (retired)  
Stillwater, Oklahoma

*For pioneering research and development of improved structures  
for soil and water conservation.*

---

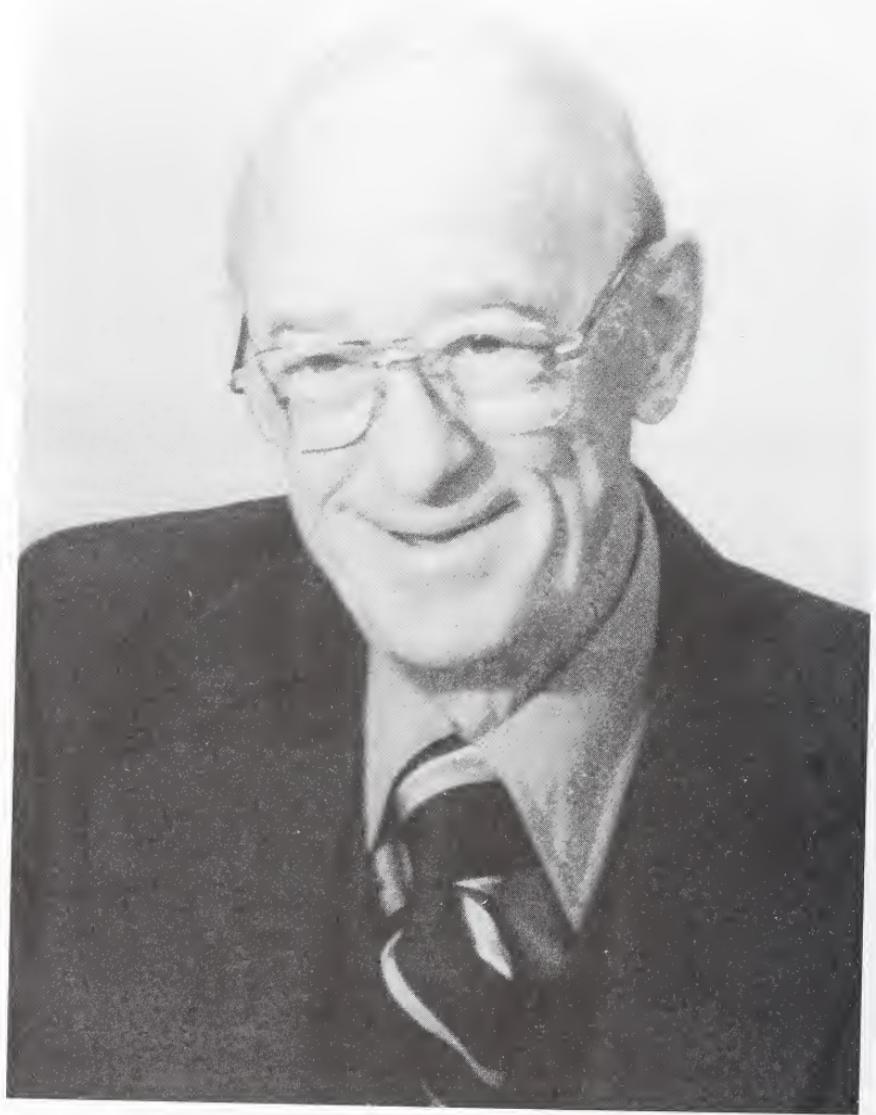
The design of almost every structure used anywhere in the world to safely "drop" flowing water in a stream channel has been influenced by research conducted by Fred W. Blaisdell. His most famous and widely used structure is the Saint Anthony Falls stilling basin, which is still universally recognized 50 years later as the smallest, most efficient, and most economical stilling basin available for dropping water from one level to another in a water conveyance channel. The challenge in the design of these structures is to effectively dissipate energy so that the integrity of the structure is maintained, the channel is protected from local erosion, and the size of the structure is kept small to minimize costs.

Besides developing structures for open channels, Blaisdell brought forth a new understanding of fluid mechanics and hydraulics of flow through closed conduits conveying water through dams and under roads. During the 1950's, when many small reservoirs were constructed in the headwaters of large watersheds for flood control, Fred Blaisdell synthesized new technology for the small dams being constructed. He conducted research on pipe characteristics including surface roughness, length, and slope to improve the design of closed conduits used as principal spillways in these small dams. He also worked to understand the mechanics of flow and erosion in the "plunge pools" at the exits of closed conduits. Based on the understanding he gained from experimental research, Blaisdell developed theory, equations, and charts used to design plunge pools that dissipate the energy of the flow to prevent erosion.

His experimental results and design methods have appeared in 134 publications; his charts and tables have been reproduced worldwide in textbooks and manuals for hydraulic engineering.

In 1992, Blaisdell was honored with the Ninth Hydraulic Structures Medal presented by the American Society of Civil Engineers.

Even after a 51-year research career and a 10-year retirement, Fred Blaisdell is actively sought out for advice on research and design. He serves as a collaborator with the USDA-ARS Plant Science and Water Conservation Research Laboratory in Stillwater, Oklahoma.



3  
1996

---

**Herbert J. Dutton**  
Chief (retired)  
Oilseeds Crops Laboratory  
Peoria, Illinois

*For pioneering research leading to the establishment of soybean oil  
as the predominant edible vegetable oil in the world.*

---

For over 40 years, Herbert J. Dutton conducted creative and productive research that centered on four major areas: suppressing the catalytic effect of trace metals in vegetable oils; establishing that the linolenic acid component of soybean oil is the precursor of off-flavors; developing reliable and credible taste-panel methods for evaluating flavor; and elucidating the mechanism of hydrogenation to reduce the linolenic acid content of soybean oil. Largely as a result of this research, soybean oil today commands 85 percent of the domestic fats and oils market.

Prior to Dutton's research, soybean oil had poor quality as an edible oil because of deterioration during storage and when used for deep fat frying. This instability in storage was accelerated by the presence of trace metals in the oil that catalyzed oxidation. Dr. Dutton established that addition of citric acid before and after refining the oil inactivated the trace metals and improved the stability significantly. These studies led to general use of citric acid as a metal deactivator.

He subsequently established that linolenate was the primary source of the undesirable flavors and discovered that, through selective hydrogenation, linolenic acid could be converted to the more stable linoleic acid without appreciable conversion of other unsaturated acids to less unsaturated analogues or saturated forms.

Dr. Dutton's research findings continue to have significant impact on soybean research today, especially on the focus of ARS and public soybean programs. Research studies he initiated concerning the human metabolism of dietary fat provided the foundation for subsequent research in the role of omega-3 and omega-6 polyunsaturated fatty acids in nutrition and the food safety of trans-fatty acids in hydrogenated fats.

The range and productivity of his research is apparent from his 200 publications and five patents. Retired from federal service, Dr. Dutton currently serves as an adjunct professor at the Hormel Institute, Austin, Minnesota, where he continues to contribute to lipid analysis, photosynthesis and biochemistry.



# 1996

---

**Charles Jackson Hearn**  
Research Geneticist (Retired)  
Horticultural and Breeding Research Unit  
Orlando, Florida

*For developing improved orange, grapefruit, and tangerine varieties used extensively by U.S. citrus producers to replace trees killed by the 1980 freezes and to expand the citrus acreage.*

---

Jack Hearn is a major player in the advancement of research on the improvement of citrus in the United States and worldwide. His research has resulted in seven new varieties during the past 16 years. These became available to growers at a time when the industry faced the challenges of replanting large acreages killed by successive freezes and changing market emphasis to meet foreign competition. Dr. Hearn's varieties represent 40 percent of the nursery-propagated grapefruit planted in Florida, 72 percent of the tangerines, and 7 percent of the citrus classified as oranges. At the retail level, these varieties contribute about \$1 billion to the U.S. economy in fruit, juice, and other citrus products. His 'Ambersweet' orange and 'Flame' grapefruit each now numbers more than 5 million nursery- and field-planted trees, with a value of \$40 million for the trees alone.

Citrus is an extremely difficult crop to breed because of extensive self-incompatibility, apomixis, and long generation times. It takes from 25 to 30 years after a cross is made for a commercial variety to be released. Nevertheless, Jack Hearn's skill and patience have increased disease resistance, improved color, lengthened shelf life, shortened maturation time, improved cold tolerance, and enlarged yields.

Dr. Hearn's achievements are many. He led a team that evaluated freeze injury as related to scion and rootstock cultivars for information on cold hardiness. These results have been used extensively in selecting cold-hardy parents for hybridization. He established self- and cross-incompatibility, identified effective pollenizers, and developed planting patterns for several citrus cultivars—innovations that resulted in substantial increases in fruit production. He participated in research resulting in the development of a chemical method for separation of nucellar and zygotic citrus seedlings, for which no satisfactory method had been previously developed.

In recognition of his significant contributions to citrus, Dr. Hearn received the 1996 Federal Laboratory Consortium Award for Excellence in Technology Transfer.

# ARS Science Hall of Fame

---

**1986**

## **Edward F. Knipling**

*For pioneering research and leadership in development of the sterile insect technique, which led to the eradication of the screw-worm, and of other technologies to suppress and manage insect pests.*

**1987**

## **Howard L. Bachrach**

*For pioneering research on the molecular biology of foot-and-mouth disease that led to development of the world's first effective subunit vaccine for any disease of animals or humans through the use of gene splicing.*

## **Myron K. Brakke**

*For consistent, career-long valuable contributions to the science of virology, particularly plant virology.*

## **Glenn W. Burton**

*For outstanding achievements in forage and turf science, which have had extraordinary effects on the forage-based cattle industry, the turf industry, and agriculture worldwide.*

## **Wilson A. Reeves**

*For outstanding research and leadership in the field of textile chemical finishing that have significantly benefited agriculture and consumers.*

## **Ernest R. Sears**

*For pioneering work in wheat genetics and for discoveries on chromosomal mechanisms that established standards in animal, plant, and human genetics.*

## **Orville A. Vogel**

*For development of the first useful semidwarf wheats and of innovative production systems that made the Pacific Northwest a major source of soft white wheat, inspired similar research efforts throughout the world, and sparked the Green Revolution.*

---

**Cecil H. Wadleigh**

*For elucidating the mechanisms through which crops respond to salinity and water stress and for inspired planning and leadership that enabled and motivated those who worked with him to expand and make use of knowledge of soils, water, and air and their interactions with plants.*

**1988**

**Francis E. Clark**

*For outstanding research leading to greater understanding of soil, plant, and microbial interactions and of nutrient cycling in terrestrial ecosystems.*

**Edgar E. Hartwig**

*For research in soybean breeding and genetics that has been a major factor in soybeans becoming the second most valuable U.S. crop and particularly for developing cultivars that thrive in the South.*

**Ralph E. Hodgson**

*For significant contributions to the knowledge of ruminant nutrition and for visionary leadership, both domestic and international, in the animal industries.*

**Hamish N. Munro**

*For career-long contributions to the science of nutrition, particularly on the relationship of dietary protein and iron to the health of the elderly, and for promotion of studies on aging.*

**Jose Vicente-Chandler**

*For research leading to new and greatly improved production systems for beef, milk, coffee, plantains, and rice for Puerto Rico and Caribbean countries.*

**1989**

**Douglas R. Dewey**

*For world leadership in genetics and taxonomy of the Triticeae tribe of grasses and for development of the cytogenetic basis for creating new grass hybrids.*

---

**Theodor O. Diener**

*For conceptualizing and discovering viroids, for leading research on viroid detection and control, and for inspiring new approaches in the search for causes of several serious diseases affecting plants, livestock, and humans.*

**Karl H. Norris**

*For developing principles and instruments using the electromagnetic wave spectrum to make rapid nondestructive measurements for evaluating quality of agricultural products.*

**John F. Sullivan**

*For engineering contributions to the food-processing and preservation industries, including development of instant potato flakes and of batch and continuous-explosion puffing.*

**1990**

**Theodore C. Byerly**

*For extraordinary contributions as a scientist, research leader, and administrator to the success of agricultural research programs and advances in U.S. and world agriculture.*

**Gordon E. Dickerson**

*For research contributions widely used by breeders to increase production efficiency of cattle, sheep, swine, and poultry.*

**Robert W. Holley**

*For isolation and characterization, including the first nucleotide sequence, of transfer ribonucleic acid (tRNA).*

**Virgil A. Johnson**

*For outstanding contributions to development of superior bread wheat cultivars and of improved wheat germplasm and for vigorous promotion of national and international cooperation among wheat breeders.*

**George F. Sprague**

*For outstanding contributions to effective methods of hybrid corn breeding and germplasm improvement.*

---

**1991**

**John H. Weinberger**

*For outstanding lifelong contributions in development of fruit varieties and fruit-breeding technology.*

**Walter H. Wischmeier**

*For developing the Universal Soil Loss Equation, which has been widely used for three decades worldwide in conservation and management of our natural resources.*

**1992**

**Raymond C. Bushland**

*For pioneering research leading to screwworm eradication by the sterile insect technique and for research leading to control of typhus vectors.*

**Lyman B. Crittenden**

*For significant contributions to retroviral genetics, transgenic animal development, and genome mapping in poultry.*

**Arnel R. Hallauer**

*For increasing understanding and use of quantitative genetics in plant breeding, which has led to development of many superior corn hybrids worldwide.*

**1993**

**John R. Gorham**

*For scientific leadership and studies that have resulted in solutions of disease control problems and have advanced the basic knowledge of viral and genetic diseases in humans and animals.*

**Sterling B. Hendricks (posthumous award)**

*For significant contributions as a chemist, physicist, mathematician, plant physiologist, geologist, and mineralogist.*

**Clair E. Terrill**

*For scientific contributions and worldwide leadership in sheep production research.*

**1994**

**Charles N. Bollich**

*In recognition of superlative accomplishments in rice breeding and genetics and their consequent benefits to American agriculture.*

**Chester G. McWhorter**

*For outstanding contributions to American agriculture through basic and applied research that has resulted in improved weed-management technology, increased yields, and reduced cost of production.*

**Malcolm J. Thompson**

*For career research contributions in the field of insect and plant steroid biochemistry.*

**1995**

**Harry Alfred Borthwick**

*In recognition of contributions in elucidating the importance of photoperiodic mechanisms controlling flowering in plants.*

**William M. Doane**

*For initiating, leading, and conducting research that created new and useful products and led to the establishment of new industries based on agricultural raw materials.*

**Walter Mertz, M.D.**

*For contributions and leadership in elucidating the importance to health of several trace elements and promoting research on dietary risk factors for chronic disorders.*



NATIONAL AGRICULTURAL LIBRARY



1023125432